BIOTA AMAZÔNIA
OPEN JOURNAL SYSTEM

SCIENTIFIC NOTE

DOI: http://dx.doi.org/10.18561/2179-5746/biotaamazonia.v9n4p59-60

Notes on field observations of reproductive strategies on *Rhinella marina* (Linnaeus, 1758) (Anura: Bufonidae) in the Eastern Amazon region

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ABSTRACT

The reproductive strategies have been well documented in toads of the Bufonidae family. Herein, we documented details of field observations of amplexi displacement and multiple amplexi in *Rhinella marina* (Linnaeus, 1758) in an urban area of the municipality of Serra do Navio, Amapá State, Brazil. Thus, this paper will increase knowledge about reproductive strategies in this species.

Keywords: Amplexi displacement; multiple amplexi; explosive breeders; Cane Toad.

Notas sobre observações de campo de estratégias de reprodução em *Rhinella marina* (Linnaeus, 1758) (Anura: Bufonidae) na região leste da Amazônia

RESUMO

As estratégias reprodutivas são bem documentadas em sapos da família Bufonidae. Nesta nota, documentamos detalhes das observações de campo do deslocamento em amplexo e múltiplos amplexos em *Rhinella marina* (Linnaeus, 1758) em uma área urbana do município de Serra do Navio, Estado do Amapá, Brasil. Desse modo, esta nota aumentará o conhecimento sobre estratégias reprodutivas dessa espécie.

Palavras-chave: Deslocamento em amplexo, múltiplos amplexos, criadores explosivos, sapo-cão.

The behavioral reproductive strategies adopted in populations of anuran as a way to obtain breeding pairs may be different in explosive, prolonged, continuous, opportunistic and sporadic reproductions. Male anurans exhibit four alternative reproductive strategies, including (1) active searching for females, (2) displacement of male, (3) male satellite behavior and (4) polyandry (POMBAL-JÚNIOR; HADDAD, 2007).

During explosive reproduction, the active search for females and the displacement of male are the most common strategies reproductive performed by male due the number of ovate females is smaller than the number of sexually active males (DAVIES; HALLIDAY, 1977; WOGEL et al., 2005; POMBAL-JÚNIOR; HADDAD, 2007). In general, the toads of the Bufonidae family are explosive during breeding events (MACHADO; BERNARDE, 2011), and these reproductive behaviors have been well documented in the genus *Rhinella* (LEVER, 2001; VARGAS-SALINAS, 2005, 2007; POMBAL-JÚNIOR; HADDAD, 2007; MACHADO; BERNARDE, 2011; BOWCOCK et al., 2013; COSTA-CAMPOS et al., 2016; GRAY; MACKENZIE, 2016). Herein we record details of amplexus displacement and multiple amplexi in *R. marina* in the field.

During an amphibian fieldwork on 12 October 2017, at 21:30 h in an urban area in the municipality of Serra do Navio, Amapá State, Brazil (0.8984°N, 52.0018°W, datum WGS84; 144 m a. s. l.), two males *R. marina* were observed near to permanent pond in amplexi simultaneously with one female. We observed that the male on the left was using the alternative reproductive strategy "displacement of male", in which this individual was trying to displace with its two hind limb the another male on the right (Figure 1A). A few minutes later, one male was in axillary amplexi, while a second male was in inguinal amplexi, and the specimens remained motionless by 10 min. The males do not emit the release call. To avoid interruptions in the reproductive mode displayed, the specimens were not collected.

At the same place, on 7 November 2017, at 20:50 h we found seven males *R. marina* in amplexi multiple attempts with a female (Figure 1B). The toads were trapped in an abandoned pool floating on a piece of wood. The amplexi was not interrupted by displacing other males in amplexi, continuing until the end of the observation period (23:30 h). Males of *R. marina* were vocalizing and also actively searching for females on the edge of the pool and floating on objects inside the pool.

Amplexi displacement in R. marina was observed for the first time by VARGAS-SALINAS (2005) in a semi-permanent pond in Region San Antonio, Quebradilhas, northwestern Puerto Rico, in which a male in axillary amplexus was trying to displace with its left hind limb the male that was in inguinal amplexus, emitting a release call. However, our observations report new behaviors not published in the scientific literature about this event in *R. marina*.

Sexual dimorphism in *R. marina* is important for its reproductive success, since larger males may dominate its rivals and obtain more mates, and larger females may produce larger or more numerous offspring than small females (BLUEWEISS et al., 1978; BOWCOCK et al., 2013; HAGGERTY, 2006). During reproduction, toads little selective approach and form amplexi with anything that moves nearby (HADDAD; SAZIMA, 1992).

Thus, our field observation of the multiple amplexus of this toad suggest that males were exhibiting the behavioral reproductive strategies "satellite male", characterized by the association of one or more males with a vocalizing individual (POMBAL-JÚNIOR; HADDAD, 2007), differing from that observed by VARGAS-SALINAS (2007), in which males exhibited behavioral reproductive strategies "active search for females", either swimming or jumping on the mud bank.

Aslo, our observation corroborates from MACHADO and BERNARDE (2011) because the authors say that the amplexi in their study involves experienced males who may perform several reproductive strategies, achieving reproductive success.

Therefore, the amplexi observed in our study reinforces the hypothesis that body size affects the dynamics of reproduction, due to significant cloacal distance and approximation of little selective males.

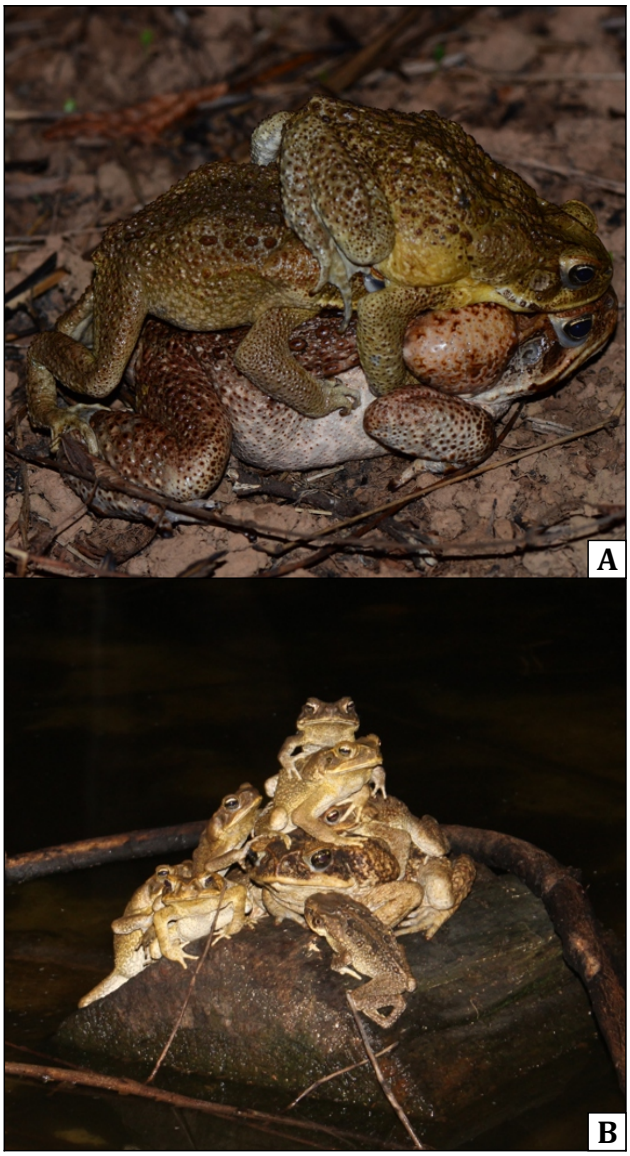

Figure 1. **A)** The male on the left was trying to displace another male on the right. **B)** Amplexi multiple attempt between seven males and one female *Rhinella marina*. / **Figura 1. A)** Macho da esquerda tentando deslocar outro macho à direita. **B)** Multiamplexo amplexo entre sete machos e uma fêmea de *Rhinella marina*.

Acknowledgments

We thank the Instituto Chico Mendes de Conservação da Biodiversidade (ICMBio) for providing collection permits (SISBIO/48102-2). FPS is grateful to Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq) for fellowship (Process #134760/2018-2).

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